SCIENCE & GOVERNMENT REPORT

The Independent Bulletin of Science Policy

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Call off the Funeral

NSF Finds Science in the US Alive and Well

While the elders of the scientific community continue to perform last rites for the American research enterprise, the embarrassing news from the science trackers at the National Science Foundation is that the country's R&D performance remains the pacesetter of the world.

That's the big point in *Science Indicators—1978,* the fourth and latest edition in the biennial pulsetaking series commissioned and published by the National Science Board, often referred to as NSF's "policy-making body." (The Board is really more of a harmless show-window collection of academic and industrial committee addicts, but the policymaking fiction pains no one and, therefore, arouses no ire.)

In any case, the 263 pages in the newest of the *Indicators* sequence constitute essential reading for science-policy aficionados, since they contain just about all the numbers, plus a light overlay of analysis, on all the issues, real and fantastic, that so often agitate the science-policy crowd in and out of Washington. (Copies

Foreign-Aid R&D Institute Hits New Congressional Snag---Page 8

are available, at $6 each, from: US Government Printing Office, Washington, DC 20402; specify Stock No. 038-000-00416-6. Consider, too, the possibility, that your Congressman can very likely get you one for free from NSF's swollen print order of 13,000 copies.)

On the big issue of which country is ahead in worldwide R&D standings, and what the trends seem to indicate, *Indicators*—prepared by a politically colorless, honest staff of civil servants deep in the bowels of NSF—provides no support for the crepehangers running loose on the American landscape. Almost any way you measure it, the US is the global giant of R&D, and, even if it has slipped a bit here and there, it is still ahead of the rest of the world in virtually every important field of science and technology.

Thus, *Indicators* reports that while the percentage of US gross national product devoted to R&D has dropped over the past decade, the US nonetheless "spends more on R&D than the United Kingdom, France, West Germany, and Japan combined." Also, supporting the cyclical theory of R&D trends, the report notes that West Germany and Japan—which have been experiencing rapid growth in R&D spending—may soon be following us along the down curve in percentage of GNP that they spend on research-related activities.

Where our chief industrial competitors, the West Germans and the Japanese, seem to hold an advantage in R&D is in the greater proportions that they devote to civilian programs. In terms of GNP, *Indicators* states, US spending on civilian research amounts to only 1.4 per cent, whereas the figure for West Germany is over 2 per cent and for Japan, it's approaching 2 per cent.

Another finding, viewed against the background of increasing concern about the US's international standing as a scientific power, is that, overall, the US has in recent years retained its position as the world's leading producer of scientific papers, and, presumably therefore, scientific knowledge.

"US scientific and technical publications as a fraction of all world literature," reports *Indicators,* "shows remarkable stability over the 1973 to 1977 period. Almost 40 per cent of this set [2100 highly cited journals] of the world's influential scientific and technical journal literature is accounted for by US authors"—though, as the table on page 2 shows, there has

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In Brief

Mixed, but generally poor, reviews have greeted the industrial innovation "initiatives" that the President announced last month (SGR Vol. IX, No. 19). *Chemical & Engineering News* **reported "waves of discontent" in the "innovation community," while various members of Congress have pummeled the plan for its lack of tax-related incentives.**

Executive Officer Bill Carey, top hired hand of the AAAS, could find nothing better to say in a Science *editorial than, "Although it hardly improves the near-term prospects for regenerating innovation in the national economy, it is credible as far as it goes."*

Meanwhile, in a letter to *The Washington Post* **commenting on D. S. Greenberg's observations about the innovation proposals, White House Science Adviser Frank Press and Domestic Policy Adviser Stuart E. Eizenstat wrote that no previous innovation "study had ever produced recommendations that a president was willing to act on. President Carter has reversed that pattern." What about the Nixon Science and Technology Message of March 20, 1972, with its 5-point section on "Improving the Climate for Innovation"? In substance, it is quite similar to many of Mr. Carter's proposals.**

. . . Some Doubts About Trends in Patents

(Continued from Page 1)

been a bit of slippage in the American-produced proportion of the world's scientific literature. This is to some important measure accounted for by the fact that other nations, such as South Korea, Brazil, and Mexico, have recently gained membership in the world scientific community, while many pre-existing members have increased the scale of their research activities. As a result, the world's R&D pie is bigger, and the US slice is relatively smaller.

In the opinion of the numerologists of science, what's important is who's talking about whose papers, which is seen to be a reliable measure of important scientific research. On that scale, according to *Indicators,* the US is a winner by far, receiving about 30 per cent more citations "than could be expected from our share of the world's scientific literature." And during 1973-77, a period in which the demise of American science was repeatedly prophesied by an assortment of our scientific luminaries, citations of American research literature increased "slightly . . . indicating that foreign scientists and engineers were making relatively more use of the US literature.

"Over the same period," *Indicators* reports, "the influence of US engineering and technology literature grew from 11 per cent to 18 per cent more than could be explained by the US share of literature in that field." By the same measure, mathematics was up from 14 to 20 per cent above the expected levels, and chemistry and physics showed even bigger gains, with 42 and 31 per cent more citations, respectively, in 1977 than the scorekeepers found justified by our raw share of the world's literature output.

The US's declining patent balance—i.e., how many we grant to inventors from other nations, *versus* how many they grant to US inventors—has been cited in recent years as a symptom of declining American inventiveness. For example, after Mr. Carter announced his industrial innovation "initiatives" on October 31—SGR Vol. IX, No. 19—his domestic policy chief, Stuart E. Eizenstat, took the rostrum in the White House press room and said that the declining patent balance was among the evidence supporting the need for the President's plan. Clearly visible winces immediately appeared on the expressions of White House Science Adviser Frank Press and Assistant Commerce Secretary Jordan Baruch. The reason, it may be assumed, is that the patent balance—as the new *Indicators* acknowledges—is no longer regarded as a telltale measure of what's going on in the industrialized economies, though patent statistics do provide valuable information. *Indicators* notes, for example, that patenting habits vary among industries, that "Patent statistics do not separate origination from development," and that firms sometimes competitively acquire patents with no intention of putting the patent into production.

On the subject of trends and shares in national R&D spending—both from government and industry—it's useful to keep in mind that the latest edition of *Indicators* covers the period immediately prior to the onset of our current inflation fever; therefore, the study's cheerful observations about a restoration of purchasing power for R&D have since been antiquated by an inflation rate that's nearly double what Adminis-

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US proportion of the world's articles[1]: 1973-1977

Field	Percent 1973	1975	1977
All fields	39	38	38
Clinical medicine	43	43	43
Biomedicine	39	39	39
Biology	46	45	42
Chemistry	23	22	22
Physics	33	32	30
Earth and space sciences	47	44	45
Engineering and technology	42	41	40
Psychology	76	75	74
Mathematics	48	44	41

1 As a percentage of the 271,000 to 279,000 articles, notes, and reviews per year from 2,100 of the influential journals of the *Science Citation Index* Corporate Tapes of Institute for Scientific Information.

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. . . No Decline Seen in Quality of Scientists

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tration budgetmakers had expected when they deliberately planned extra helpings of financial assistance for many science-related activities.

What emerges clearly from *Indicators* is that the big winner these days is applied research, up 20 per cent since 1968 in "real" dollars, in response, the study suggests, "to heightened concern about conducting research which may have relatively short-term economic and social benefits." Meanwhile, real basic research expenditures "are only slightly higher than the previous maximum, which was reached in 1968." A bright note concerning basic research is that within industry, it seems to be continuing its pullout from the long nosedive that began over a decade ago, with the result that, following a 27 per cent decline from 1966-72, a small recovery began in 1975, and is apparently still underway.

The report adds little to the widely discussed subject of science and engineering student enrollments and job opportunities. Science and engineering employment is growing faster than the general economy, but enrollments are high enough to assure that "the supply of scientists is more than ample to satisfy the current demand in most occupational fields and that the demand for engineers is in rough balance with available supply." (That latter point may already be out of date, given widespread reports of the difficulties that recruiters are having in finding engineers, plus the record starting salaries now offered new engineering graduates.)

Where *Indicators* is fresh and interesting in regard to manpower is in its brief discussion of "Questions (that) have been recently raised concerning a decline in the quality of the S/E (science and engineering) work force." The report concludes that "These questions are

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National R&D expenditures as a percent of GNP by source: 1960-79
[Dollars in billions]

	Current dollars					Constant 1972 dollars				
		All R&D by source					All R&D by source			
Year	GNP	Total	Federal	Other	Basic & applied research	GND	Total	Federal	Other	Basic & applied research
1960	$ 506.0	$13.5	$ 8.7	$ 4.8	$ 4.2	$ 736.9	$19.7	$12.7	$ 7.0	$ 6.1
1961	523.3	14.3	9.2	5.1	4.5	755.3	20.7	13.4	7.3	6.4
1962	563.8	15.4	9.9	5.5	5.4	799.1	21.8	14.0	7.8	7.6
1963	594.7	17.1	11.2	5.9	5.7	830.7	23.8	15.7	8.2	8.0
1964	635.7	18.9	12.5	6.3	6.4	874.3	25.9	17.2	8.7	8.8
1965	688.1	20.0	13.0	7.0	6.9	925.9	27.0	17.5	9.5	9.3
1966	753.0	21.8	14.0	7.9	7.4	981.0	28.5	18.2	10.3	9.7
1967	796.3	23.1	14.4	8.8	7.8	1,007.7	29.3	18.2	11.1	9.9
1968	868.5	24.6	14.9	9.7	8.4	1,051.8	29.8	18.1	11.7	10.2
1969	935.5	25.6	14.9	10.7	8.8	1,078.8	29.6	17.2	12.4	10.1
1970	982.4	25.9	14.7	11.2	9.2	1,075.3	28.4	16.1	12.3	10.1
1971	1,063.4	26.6	14.9	11.7	9.4	1,107.5	27.7	15.5	12.2	9.8
1972	1,171.1	28.4	15.8	12.6	9.8	1,171.1	28.4	15.8	12.7	9.8
1973	1,306.6	30.6	16.3	14.3	10.6	1,235.0	29.8	15.4	13.5	10.0
1974	1,412.9	32.7	16.8	15.9	11.5	1,217.8	28.2	14.4	13.8	9.9
1975	1,528.8	35.2	18.2	17.0	12.5	1,202.1	27.7	14.3	13.4	9.8
1976	1,700.1	38.8	19.6	19.2	14.0	1,271.0	29.0	14.7	14.3	10.4
1977 (prelim.)	1,887.2	42.9	21.6	21.3	15.3	1,332.7	30.3	15.2	15.0	10.8
1978 (est.)	2,100.0	47.3	23.8	23.5	16.8	1,382.5	31.1	15.7	15.5	11.0
1979 (est.)	2,325.0	51.6	25.7	25.9	18.5	1,430.8	31.8	15.8	15.9	11.4

* Deflators for 1978 and 1979 assume an inflation rate of 7.3 and 7.0 percent, respectively. It is likely that actual inflation rates will be substantially higher; therefore, the constant dollar estimates presented throughout this report may be too high.

SOURCE: National Science Foundation, *National Patterns of R&D Resources, 1953-1978-79* (NSF 78-313), p. 36.

. . . Strong on Input, Weak on Output Analysis

(Continued from Page 3)

difficult to answer, since there are no direct measures of work force quality." Nonetheless, it continues, "two related measures suggest that the quality of S/E's has not decreased: experienced S/E's continue an undiminished participation in training programs; and test scores for prospective S/E graduate students on both the verbal and quantitative components of the Graduate Record Examination remain high and unchanged, both absolutely and relative to nonscience fields."

What's to be concluded, then, about the overall health of the American R&D enterprise? If *Indicators* is accepted as a reliable assemblage of evidence—and it seems to merit that standing—it seems that the US is indeed doing very well. To the extent that there have been changes in international standings, these seem mainly to stem from improvements abroad rather than deterioration at home.

The more important measure, however, may be in terms of US performance versus US potential, which, though an extremely difficult matter to gauge, does invite many questions about US science-policy affairs. Closely related to this, and of extreme significance, is the ongoing debate among *Indicators'* compilers and observers concerning input-output relationships. As noted in SGR Vol. IX, No. 19, the General Accounting Office, among others, feels that the *Indicators* series tells a great deal about what goes into the US research enterprise, but offers relatively little on the value of what comes out. The reason for this, of course, is that there are no reliable yardsticks for most of the output side. The *Indicators* series, however, keeps getting better, and the latest edition, more so than any of its predecessors tries as best as can be done with present knowledge and techniques to address these and many other important concerns.—DSG

Total US basic research expenditures: 1960-1979

[Dollars in millions]

Year	Current dollars	Constant 1972 dollars
1960	$1,197	$1,743
1961	1,401	2,022
1962	1,724	2,444
1963	1,965	2,745
1964	2,289	3,148
1965	2,555	3,438
1966	2,814	3,666
1967	3,039	3,846
1968	3,274	3,965
1969	3,425	3,949
1970	3,513	3,845
1971	3,577	3,725
1972	3,748	3,748
1973	3,877	3,665
1974	4,144	3,571
1975	4,527	3,561
1976	4,881	3,649
1977 (prelim.)	5,440	3,842
1978 (est.)	6,045	3,980
1979 (est.)	6,700	4,123

Deflators for 1978 and 1979 assume an inflation rate of 7.3 and 7.0 percent, respectively. It is likely that actual inflation rates will be substantially higher; therefore, the constant dollar estimates presented throughout this report may be too high.

SOURCE: National Science Foundation, *National Patterns of R&D Resources, 1953-1978-79* (NSF 78-313), p. 38.

A Swiss View of US Science

The following excerpt is from an address in May at UCLA, "Science Policies and Innovation on Two Sides of the Atlantic," by Professor A. P. Speiser, Director of Research, Brown, Boveri & Co. Ltd., Switzerland, and member of the Council of the Swiss Federal Institutes of Technology.

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I am sometimes consulted by Swiss bankers who know that I am carefully watching American science and technology — bankers who need advice where to invest their funds and how to advise their clients. They want to know what I think about the future of US technology.

I am optimistic. American science policy and innovation in the past 30 years have been immensely successful. Science policy in the US — as in any other country — is an outgrowth of the political system, and the political system in turn is a crystallization of deeply rooted convictions and ways of life that do not rapidly change as times pass. The American economy is basically strong. With few exceptions, America has all the raw materials it needs — no other country can make this claim. Its agriculture is immensely productive and is the world's largest exporter. The business leaders' managerial flexibility — a traditional American asset — is undiminished; risk capital is still more easily available than elsewhere. Any difficulties that now have to be faced are no more serious in the US than in other countries.

Women Scientists Faring Better, Study Finds

In university science departments today, there are two prevailing, but contradictory, views about the way academic science operates. On the one hand, the physical and life sciences and even the social sciences are seen as among the last bastions of male chauvinism. On the other hand, the scientific disciplines are assumed to be endeavors in which advancement depends entirely on merit.

How have women really fared in the academic sciences? That is the question that Jonathan R. Cole, a sociologist at Columbia University, tries to answer in *Fair Science: Women in the Scientific Community,* a 336-page book published last month by the Free Press, a division of Macmillan Publishing Co., Inc.

After tracing the careers of men and women scientists over nearly two decades, Cole concludes that, though sex discrimination has been a burden for women, the difficulties are not nearly as severe as is generally assumed.

But the good news, Cole admits, ends there. While a number of women may have gotten through the door of university research departments, most have found themselves stuck at the entry level far longer than their male colleagues.

As Cole himself puts it, "Within the academic marketplace, women still face formidable barriers to promotion to high rank."

As far as many feminist groups are concerned, Cole's description of the problems faced by women in the sciences is an overly polite — perhaps an overly gentlemanly way of describing an intolerable situation.

Nontheless, Cole's study is worth paying some attention to, for it offers one of the first thorough studies of what has happened to female scientists over the past few decades, and it even contains a fairly serious analysis of what may be in store for them in the future.

In the first place, says Cole, who is director of Columbia's Center for Social Sciences, it is "no accident" that until 1971, the largest compilation of biographical information about living scientists was entitled *American Men of Science.*

It is no news to anyone, he says, that until recent decades, women simply did not undertake scientific careers. With rare exception, those who did were relegated to a "hidden community."

But, he continues, much of that has changed.

"Since the late 1950s and certainly in the 1970s," Cole states, "women have been just as apt as men to find jobs in distinguished departments; they have received roughly equal salaries when in the lower ranks, and have been honored with as many awards or prizes (although not the most prestigious ones) and postdoctoral fellowships."

The belief, still widespread among scholars, that there is systematic bias in hiring female PhD's is unsupported by the data, Cole says.

Although Cole used data drawn from multiple samples of male and female scientists who received their degrees from 1911 to 1970, his conclusions are based largely on the careers of 565 men and women scientists, from the time they earned their doctorates in 1957-58 through 1975.

Cole matched those men and women by year of graduation, university affiliation, academic specialty, and measured intelligence. He then compared their productivity, publication records, promotion histories, degrees of recognition, reputations, and marital and childbearing status.

One of Cole's most controversial conclusions is that marriage and children do not, as many have assumed, hinder the scientific and scholarly production of men or women.

In the first place, Cole says, women scientists who interrupt their careers for childbearing generally do so only for short periods of time; most of them return promptly to the work force.

Moreover, Cole found that married female scientists published more scientific papers than unmarried ones and married women with one or two children published more than those without children.

Cole cites a number of reasons for the improvement of women's position. For one thing, he says, cultural pressures for women not to work have been neutralized by new pressures to pursue careers. The enrollment increases of the 1950s and 1960s also opened many new job opportunities in universities for trained women specialists.

Cole also argues that the closing of the gap between elite and non-elite institutions, brought on by dramatic improvements in state-operated universities, has forced shifts in the traditional academic power structure, which, in turn, have opened new opportunities for women.

Finally, Cole says, the diversification of professors'

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Coates Sets up Consulting Firm

Joseph F. Coates, one of the founding fathers of technology assessment and until recently a senior staff member of the Congressional Office of Technology Assessment, has established his own policy analysis and research firm, JF Coates, Inc. Address: 3738 Kanawha St. Nw., Washington, DC 20015; tel. (202) 966-9307.

. . . Cole Doubts Need for Affirmative Action

(Continued from Page 5)

social backgrounds has changed the ideological "tone" at many institutions, particularly the leading ones.

Cole admits, however, the shifts in attitudes toward women may not have gone far enough.

On the average, Cole found, women do not produce as much or as high quality research as do their male colleagues. But the distinction between their work does not nearly explain entirely the wide discrepancy in promotion and rank in the scientific community.

While Cole agrees that women scientists are a "group of survivors" who have had to go "against the grain of occupational stereotyping," his book will not be seen as a rousing endorsement for the sort of tough-minded affirmative-action programs that many academic women would like to see instituted.

In fact, Cole makes clear his skepticism of most of the current approaches to affirmative action. He is troubled, for example, that so many programs are based more on "impressionist evidence" than on actual data.

"The evidence presented in this book suggests that remedial action in the form of affirmative action quotas is not needed for achieving still greater equality between the sexes in science," he states.

The only kind of affirmative-action programs that Cole feels will be successful are the ones that try to change the perceptions and expectations of young girls. But, most feminists are quick to point out that, to pass the buck in that way usually means long delays in achieving the social and political changes needed to break down the academic hierarchy.

For the past two years, Senator Edward M. Kennedy (D-Mass) has introduced bills aimed at encouraging more women to seek careers in science and technology and also to prod federal agencies, particularly the National Science Foundation, into providing more research opportunities for women.

Each year, however, it's contended that Congressional schedules are so packed with more pressing business, that the women-in-science bills — and even discussions of them — have been deferred. Whatever justification lawmakers may have had before in ignoring the problems of women in science, the Cole study will now give them even more reason to think the problems are not as bad as some women have made then out to be.

Probably the only truly optimistic note on the women's-equality front these days is a report by the Census Bureau which says that women are significantly narrowing the gap with men at the nation's colleges. The study, released last month, shows that in 1970 men attending college outnumbered women by 1.4 million, but by 1978 that lead had shrunk to an estimated 410,000. Although two-year college enrollments have been a significant factor in the increase, graduate-school enrollments also are up. Between 1970 and 1978,

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In Print

National Strategy for Technological Innovation, 63 pages, published by the Senate Committee on Commerce, Science, and Transportation, might pass unnoticed, but for the fact that its author is Ellis R. Mottur, a longtime staff associate of Senator Edward Kennedy. Mottur, once the Senator's key aide for NSF matters, and, after that, the Kennedy man on the staff of the Office of Technology Assessment, wrote the report while in a holding pattern at the Smithsonian's Wilson International Center for Scholars; he has since returned to the Kennedy camp. Most of Mottur's innovation recipes have been heard before, but one newish item is a proposal for a "National Science Endowment which, by the year 2000, will provide sustained, stable funding for basic research on a self-supporting, self-regulating basis." Free copies available (send self-addressed mailing label) from: Committee on Commerce, Science, and Transportation, US Senate, Washington, DC 20510; tel. (202) 224-9351.

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Privacy and Confidentiality as Factors in Survey Research, a 274-page product of a big, ongoing study growing out of the increasing slammed-doors-in-the-face that opinion surveyers are encountering. Produced by a study group assembled by the National Research Council of the National Academy of Sciences, the study found extreme skepticism about confidentiality of survey responses. Copies, at $12.75 each, are available from: Office of Information, National Research Council, 2101 Constitution Ave. Nw., Washington, DC 20418.

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Science and Technology: A Five-Year Outlook, debut of a periodical report mandated by the 1976 Act of Congress that created the White House Office of Science and Technology Policy; it was supposed to be produced by OSTP, but, since forecast-type reports are burdensome and profitless, OSTP hived it off to NSF, which, in turn, hired the National Academy of Sciences, which engaged a platoon or two of consultants to produce a discipline-by-discipline account of where we're at and where we might be going: 544 pages, available for $9.95 paperback, $15 hardback, from: W. H. Freeman and Company, 660 Market Street, San Francisco, Calif. 94102; also, 20 Beaumont St., Oxford, England.

In Quotes: Role of Research In the Developing Nations

The following excerpt is from a paper contributed by the United Nations Educational, Scientific and Cultural Organization to the International Seminar on Science, Technology and Society in Developing Countries, November 13-16 in Bombay:

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. . .Researchers in the developing world could serve their own country better by interesting themselves in the development of products meant to improve the standard of living of the rural and poor urban populations, using achievements in modern technology to improve traditional craftsmanship. . .

However, the change towards R&D is meeting certain resistance from researchers in the developing countries, many of whom received their training in industrialized countries. The reasons for this are partly because these researchers will be obliged to engage in work incompatible with the scientific status they have acquired through studies abroad and, partly because they will be bound to carry out research in a field which may isolate them, literally speaking, from sources of technological advancement in their country.

The intention here is not to raise criticism against researchers in developing countries, for many of them are carrying out valuable work under difficult conditions, including very often small financial contributions from their government. Research under contract from the industry may provide supplementary revenue. Technology transfer involves strong interaction between the industry and research. But to realize such cooperation is not an easy affair. . .

New NRC Research Chief

Robert J. Budnitz will move up January 1 from Deputy Director to Director of the Office of Nuclear Regulatory Research of the Nuclear Regulatory Commission, succeeding Saul Levine, who is retiring after 37 years of government service.

WOMEN

(Continued from Page 6)

the report shows, female attendance doubled, while male attendance grew only 21 per cent. — Anne Roark (The Author is an Assistant Editor of *The Chronicle of Higher Education.*)

Academy Study Warns Of Faster Ozone Depletion

The latest word on ozone is that it's being wiped out at a far faster pace than was previously assumed. That's the finding of a panel of the National Research Council, National Academy of Sciences, headed by Harold I. Schiff, of York University, Toronto.

While industrial critics assailed earlier warnings of a chemically induced 7.5 per cent ozone depletion, half of which might occur over the next 30 years, Schiff's panel, drawn from far and wide, has calculated the figure at 16.5 per cent.

Though the US has banned the use of ozone-depleting aerosols, other nations still permit their manufacture and sale, and the US also permits the use of other ozone depleters, such as halocarbon F-22 for refrigeration and the use of industrial solvent methyl chloroform.

The panel's findings are in a report, "Stratospheric Ozone Depletion by Halocarbons: Chemistry and Transport," of which the Academy says it has no spare copies, except for the press. Still to come is a companion report, "Protection Against Depletion of Stratospheric Ozone by Chlorofluorocarbons."

DOE Appoints Defense Aide

Philip E. Coyle III, Deputy Associate Director for lasers at the Lawrence Livermore Laboratory, has been appointed Deputy Assistant Director for Defense Programs in the Department of Energy.

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Budget Blocked for Foreign-Aid Institute

The newly created Institute for Scientific and Technological Cooperation (ISTC) was mired in new troubles last month as the Justice Department began a probe into allegations that the agency illegally used government funds to lobby on its own behalf.

The Institute, which was the centerpiece of the US plans for the United Nations Conference on Science and Technology for Development, in Vienna, last summer, has been the object of bitter controversy since it was created. Its main tormentors are conservative Senators opposed to adding another agency to the foreign-assistance bureaucracy.

Although the full Senate, after several cliffhanging votes, finally went along with the House in authorizing ISTC, the Senate has so far refused to follow the House in providing funds for the Institute. The matter has been deadlocked for weeks in a House-Senate conference and will probably not be settled until the Justice Department probe is complete.

The creation of ISTC was included in an overall foreign-assistance reorganization plan under which the Institute, as well as the Agency for International Development (AID), became part of a new International Development Cooperation Administration. The plan called for a transfer of approximately $70 million of AID's research programs to the Institute, as well as nearly $25 million in new funds.

In preparation for the transition from AID to ISTC, Congress approved the establishment of a planning office, which may be the cause of all the problems now facing the Institute.

According to the Senate allegations, the planning office violated a federal law passed last year prohibiting State Department agencies from using public funds to publicize their programs. While acknowledging that there is a fine line between what is lobbying and what is not, Senator Dennis DeConcini (D-Ariz.), who has been the leading opponent of ISTC, said that documents obtained during a Senate investigation showed a vigorous effort by the ISTC planning office to line up support from a number of universities.

The Senate panel with authority over foreign-aid spending has cited at least nine institutions: Atlanta University, University of Arizona, Cornell University, Johns Hopkins University, the University of Hawaii, Michigan State University, the University of Missouri, the State University of New York at Buffalo, and the University of Wisconsin.

In carrying out their investigation, the Senate panel turned up a number of incriminating letters between the Institute, the universities, and their Congressmen. One letter, for example, showed that the University of Hawaii expected to alter its programs to gain support from ISTC. Apparently in return for the promise of support, the University sent a letter to Sen. Daniel Inouye (D-Hawaii), urging him to support the agency on the grounds that a major part of its work would relate to the university's program.

While supporters of ISTC do not all condone the planning offices practices, some of them point out that getting lawmakers to listen to the arguments in support of ISTC sometimes calls for rousing up the troops back home.

That ISTC supporters are still behind the agency is hardly surprising, considering all the build up it was given in Vienna last summer. US delegates at the UN conference repeatedly pointed to ISTC as evidence to the Third World of how serious the US was in its efforts to beef up overseas research programs. To have the agency killed at this point would cause a number of State Department officials and other US officials considerable embarrassment.

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